

Claims

1. Process for recovery of the silica present in the separators located between the elements of lead-acid batteries, characterized in that it comprises the following operations:
- a) washing the heavy plastics to remove the lead compounds and other foreign bodies,
  - b) separating the plastics from the washing solution,
  - c) lead recovery and regeneration of the washing solution,
  - d) rinsing of the plastics,
  - e) drying of the plastics,
  - f) separation of the granular plastics from the thin plastics (polyethylene with silica filler, PVC, fabrics) by drawing them up in a flow of air making use of the shape effect,
  - g) separation of the PVC and fabrics from the polyethylene with silica filler through fragmentation,
  - h) pyrolysis of the polyethylene with silica filler,
  - i) cracking of the pyrolysis gases and vapours in order to reduce their molecular weight and render them more suitable for handling and combustion to provide the heat necessary for pyrolysis,
  - j) oxidation of the pyrolysis residue to remove carbonaceous residues and recover the silica,
  - k) pyrolysis of the mixture of PVC and fabrics in the presence of alkaline substances,
  - l) oxidation of the residue from the pyrolysis of PVC and fabrics with the production of inert ashes.
2. Process according to Claim 1, in which the heavy plastics are washed with an aqueous solution containing compounds capable of dissolving the

lead (II) compounds and substances capable of reducing lead (IV) to lead (II) at a temperature between ambient temperature and the boiling point.

- 5    3.    Process according to any of the preceding claims  
in which the spent washing solution is regenerated  
by treating it with alkali metal or alkaline earth  
sulphides or by treating it with metals which are  
less noble than lead making use of the cementation  
10    reaction which replaces the lead in solution with  
cations of these metals.
4.    Process according to any of the preceding claims  
in which the granular plastics are separated from  
15    the thin plastics by drawing up in a flow of air  
making use of the shape effect.
5.    Process according to any of the preceding claims  
in which the polyethylene is separated from the  
20    PVC and fabrics by making use of the lesser  
brittleness of polyethylene in comparison with the  
other materials in a machine comprising a  
perforated cylinder in which numerous arms of  
rubber or other suitable material rotate scraping  
25    the inner surface of the cylinder.
6.    Process according to any of the preceding claims  
in which the polyethylene with quality silica  
filler is pyrolysed for a time of between 10 and  
30    60 minutes, preferably between 20 and 45 minutes,  
at a temperature of between 300°C and 600°C,  
preferably between 470°C and 530°C, and in which  
the pyrolysis gases and vapours are caused to pass  
to a catalytic cracking reactor.
- 35    7.    Process according to any of the preceding claims  
in which the pyrolysis residue is oxidized under  
controlled temperature conditions between 400°C  
and 600°C, preferably between 450°C and 500°C, in

the presence of a gaseous mixture comprising an inert gas and oxygen in a percentage of between 3% and 7%.